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ABSTRACT

Taiwan is facing these three challenges: cultivating a world-class work force, preventing shortages of industry-related workers, and increasing industrial competitiveness. To meet them, technological and vocational education (TVE) needs to integrate the curricula among the technical arts programs in junior high schools, senior vocational high schools, technical institutes, and institutes/universities of technology. The key elements of integration are development of clearly targeted, well-defined educational objectives and use of academic and industry skill standards to direct integrated learning. Articulation produces graduates with high-level skills and clearer goals. The Ministry of Education has implemented policies that include a framework for the integrative curriculum planning with these three major components: occupational clusters, curriculum, and supplementary measures. Educational authorities are responsible for establishment of competency standards, occupational clusters, and curricula. Vocational high schools and junior colleges are responsible for curriculum development, teaching, and evaluation. Results of 14 completed projects have been analyzed to form these three policies to direct future curriculum development: establish 17 occupational clusters; delineate responsibilities and procedures between schools and educational administration; and develop a model to design and implement school-based curriculum development in TVE. (Contains 11 references.) (YLB)

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# Integrative Curriculum Planning in Technological and Vocational Education in Taiwan, Republic of China

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# Integrative Curriculum Planning in Technological and Vocational Education in Taiwan, Republic of China

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*Robert T.Y. Wu*

## Abstract

Taiwan is facing three challenges, including cultivating a world-class workforce, preventing shortages of industry-related workers, and increasing industrial competitiveness. In order to meet these challenges, the technological and vocational education system urgently needs to integrate the curricula among the technical arts programs in junior high schools, senior vocational high schools, technical institutes, and institutes/universities of technology.

This paper addresses the background of integrative curriculum planning, integrative curriculum planning strategies, some resulting policies and conclusion in technological and vocational education. It is concluded that constant improvement in building up school-based curriculum and management, curriculum articulation, and integration can result in coherent and fully articulated curricula for educating students.

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**Keywords:** integrative curriculum planning, technological and vocational education, curriculum articulation, curriculum integration

As we move into the new millennium, most of the countries in the world are facing nearly the same challenges, including cultivating a world-class workforce, preventing shortages of industry-related workers, and increasing industrial competitiveness. To meet these challenges, career and technical education needs to improve its quality by promoting skill standards as a basic element in planning curriculum articulation among schools at all levels, and integrating existing curricula. Technological and vocational education in Taiwan is of no exception. An innovative integrative curriculum planning is crucial to meet the needs for a high quality workforce that can sustain the economic stability. This paper elaborates on the background of the integrative curriculum planning, the illustration of the planning strategies, some resulting policies, and the conclusion in technological and vocational education.

## Background of the Integrative Curriculum Planning

During the past four decades, national economic development has been well planned by the Taiwan government, and technological and vocational education (TVE) has played a pivotal role in providing technical human resources. Since then, TVE has shifted from unit-trade training to clustered vocational education, and to the establishment of technological education in higher education (Wu, 2000). Although the sound TVE system was recently established and educational opportunities for students at all levels increased substantially to meet students' needs, the curricula at each level are not quite organized yet (Hwang, 1999). This means that there is a gap between what is learned in school and what is required by the industry in the workplace. In other words, the integration of academic and vocational curriculum has not been attained, and seamless or fully articulated curricula are not occurred at the different educational levels in TVE.

Before further discussion in detail, Taiwan's current TVE context needs to be described. The TVE system in Taiwan encompasses three levels: senior vocational high schools, junior colleges of technology, and colleges/universities of technology (see Figure1). Technical arts programs in junior high schools designed for the purpose of career exploration and preparation also serve as another supplementary agency to the system. In the 1998-99 academic year, the number of students enrolled in TVE schools reached a total of 1,012,780, which accounted for 58.9% of the total number of students in both upper-secondary and postsecondary schools. Of these, there were 67,379 students from twenty-six colleges/universities of technology,

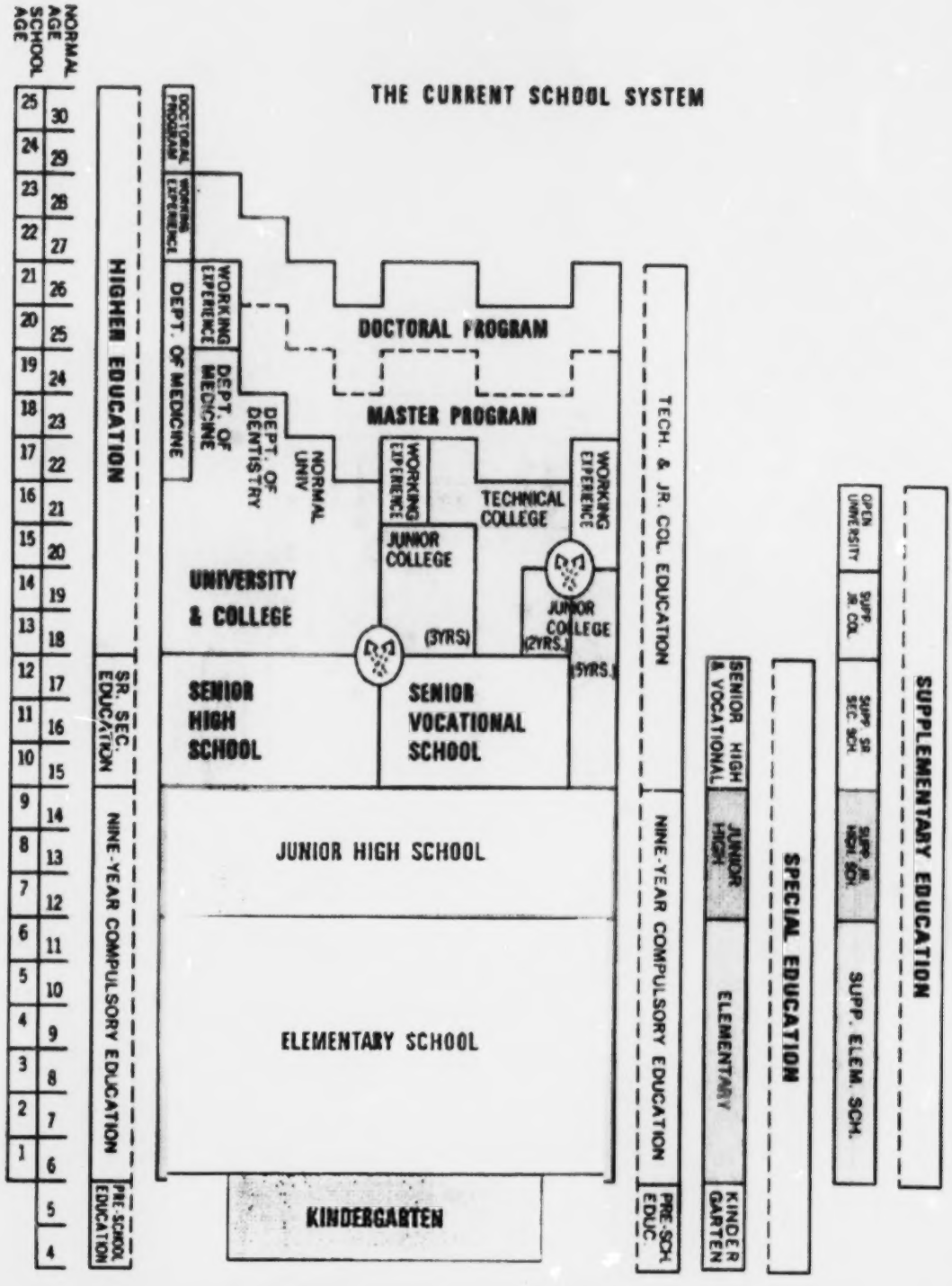


Figure 1 The Educational System of Taiwan



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452,346 students from fifty-three junior colleges of technology (including 197,855 students in 5-year colleges, 254,427 students in 2-year colleges, and 64 students in 3-year colleges), and 493,055 students from 201 vocational high schools (Ministry of Education, 2000).

Hwang (1999), the Director of Technological and Vocational Education, described the rationale for the initiation of integrative curriculum planning. First, the TVE system including the three levels of schools is relatively well organized compared to similar systems in other countries. However, the inconsistency in the curriculum at the different levels of schools becomes problematic. Second, because curriculum is a key element in the educational process and impacts everyone involved in teaching and learning (Finch & Crunkilton, 1993), it is impossible to improve the quality of TVE without having a fully articulated quality curriculum system. Third, the curriculum should be future-oriented. For establishing more coherent and comprehensive curricula, the curricular reform needs to include future requirements for life and work. Fourth, a continuous curricular reform mechanism should to be maintained to ensure that the curriculum is in line with the social, political, and other influencing factors. Furthermore, the supplementary measures needs to be taken to aid the curricular reform. Finally, although this initiative is mandated by social changes and individual needs of students, school-based curriculum and management are required in order for schools to develop their own curriculum that can address the needs of their students, community, and industry.

## Integrative Curriculum Planning Strategies: An Illustration

Though important, the integration of curriculum is difficult. Hoachlander (1999) suggested that curriculum should be integrated to increase student achievement and that there are four forms of integration for teachers to apply: course-level integration, cross-curriculum integration, programmatic integration through career clusters and industry majors, and schoolwide integration. In addition, the key elements in integration are clear-targeted, well-defined educational objectives, and the use of academic and industry skill standards to direct integrated learning.

Articulation is another important issue in integrative curriculum planning among schools at different levels. The major benefit of curriculum articulation is to produce more graduates with high-level skills and clearer goals. If curriculum articulation among the three educational levels of schools in TVE can be reached through a close examination of the curricula, students may subsequently learn effectively and attain

more of the established curricular requirements.

Both integration and articulation require educational and skill standards for formulating educational goals and objectives, contents, and evaluation. Examples are the national skill standards in America and Australia (American Training Standards Institute, 1998; Hamilton, 1999). Figure 2 shows the effect of national skill standards on vocational education and training in Australia. In America, the Tech-Prep programs, school-to-work transition programs, and integration of academic and vocational curriculum activities are also consistently underway to improve student achievements and educational quality.

In 1998, the Ministry of Education held a meeting on "National Integrative Curriculum Planning in Technological and Vocation Education" and related policies were made. Policies relating to the planning strategies of the initiative included a framework for the integrative curriculum planning ( see Figure 3 ) , and the implementing entities involved in the curriculum development process ( see Figure 4) ( Lee, 1999 ) . In the framework, there are three major components including occupational clusters, curriculum, and supplementary measures. Thirty-four projects were contracted to experts in their respective fields. The topics of the projects ranged from the foundation of curriculum development in TVE, orientation, objectives, and functions of TVE schools, skill standards, occupational clusters in TVE, school-based curriculum development in TVE, to competency-based education models, curriculum revisions in vocational high schools, junior colleges, and colleges/universities of technology, recurrent education, teacher education, student enrollment, and other related subjects ( Hwang, 1999 ) . Figure 4 shows that educational authorities are responsible for the establishment of competency standards, occupational clusters, and curricula while vocational high schools and junior colleges are responsible for curriculum development, teaching, and evaluation.

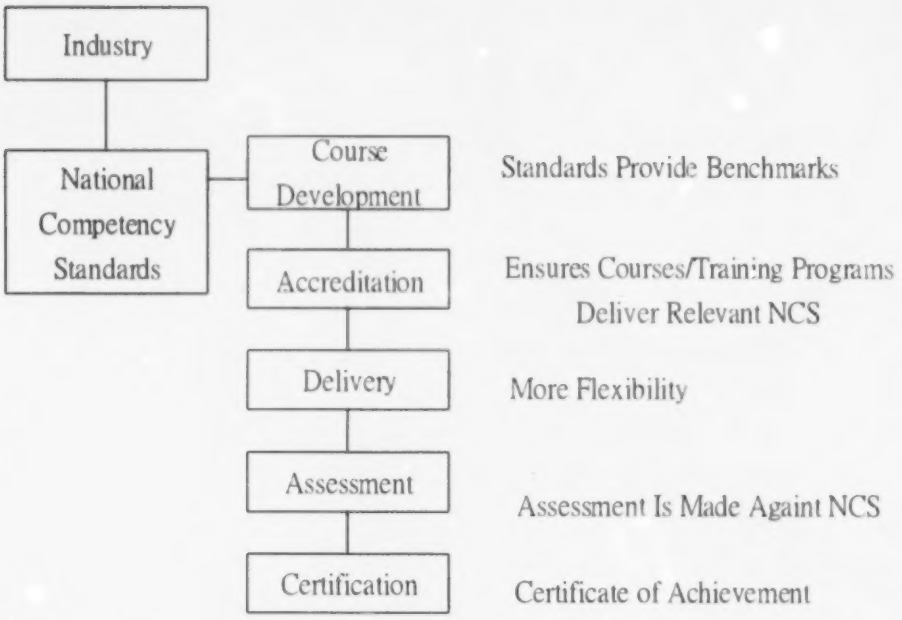


Figure 2 National Competency Standards and Somponents of the Emerging System of VET

*Source*: Hamilton, M. (1999). *Implementation and management for competency based training.* In Australia-Taiwan Seminar on competency-Based Training, 47-49, May 21, 1999, Taipei, Taiwan.

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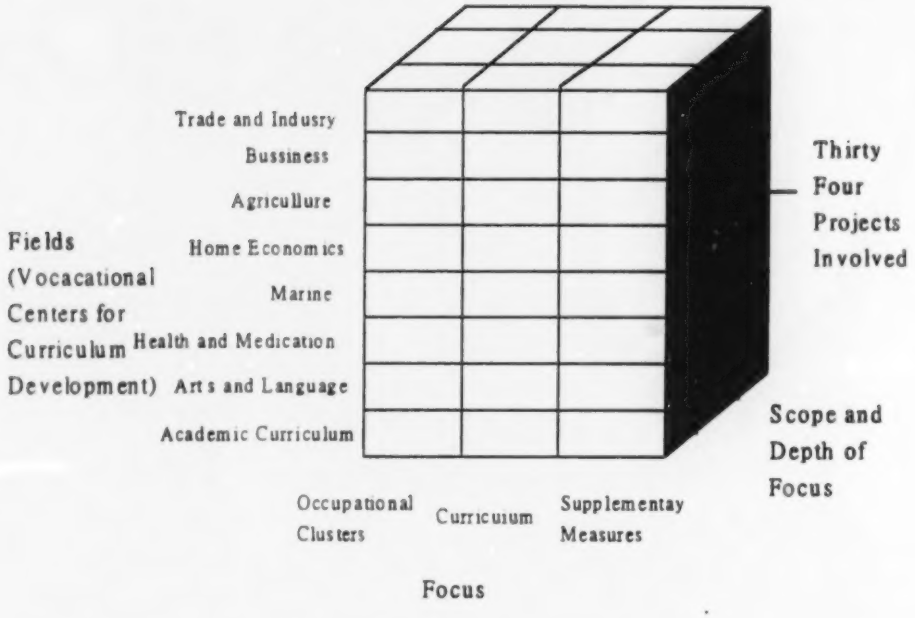


Figure 3 Plan and Focus of Integration Curriculum System
*Source*: Lee (1999), p. 16.

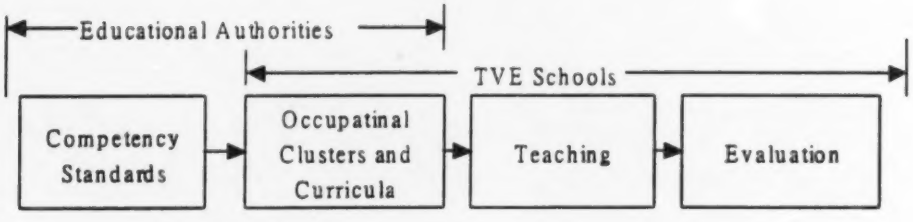


Figure 4. Consideration Components of and Responsible Entities for Integrative Curriculum Development
*Source*: Lee (1999), p. 16.

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## Some Resulting Policies

By the end of 1999, fourteen projects were finished and the results of these projects were analyzed to form policies to direct future curriculum development ( Lee, 1999 ) . After exploring educational orientation, objectives, and functions of TVE schools, foundation of curriculum development in TVE, occupational clusters and other subjects, the results of these projects suggested that seventeen occupational clusters should be established to articulate the titles and contents of occupational programs at different levels of TVE schools ( see Figure 5 ) .

The second formulated policy delineated the responsibilities and procedures between schools and educational administration (see Figure 6). For vocational high schools and junior colleges of technology, the government prescribes the curriculum standards. These schools then develop curriculum plans, require teachers to write lesson plans, acquire teaching resources, and submit curriculum plans to the government for review. On the contrary, colleges/universities of technology can develop their own curriculum without government prescription and review.

The third policy is related to school-based curriculum development in TVE. A group of researchers applied the theories of school-based curriculum development and developed a model for designing and implementing school-based curriculum to ensure that the top-down curriculum standards can be transformed into a vigorous, systematic, and school-based curriculum to best fit the students' learning environments at both vocational high schools and junior colleges. On the other hand, the concept of school-based curriculum development is also instrumental in developing sound curricula in colleges/universities of technology (Lee, 1999).

Based on the results of the projects, the remaining policies will be further analyzed. The more concrete the policies, the more constructive they can be in contributing to the establishment of integrative curricula in TVE, thus facilitating the congruence and coherence of curricula at different school levels.

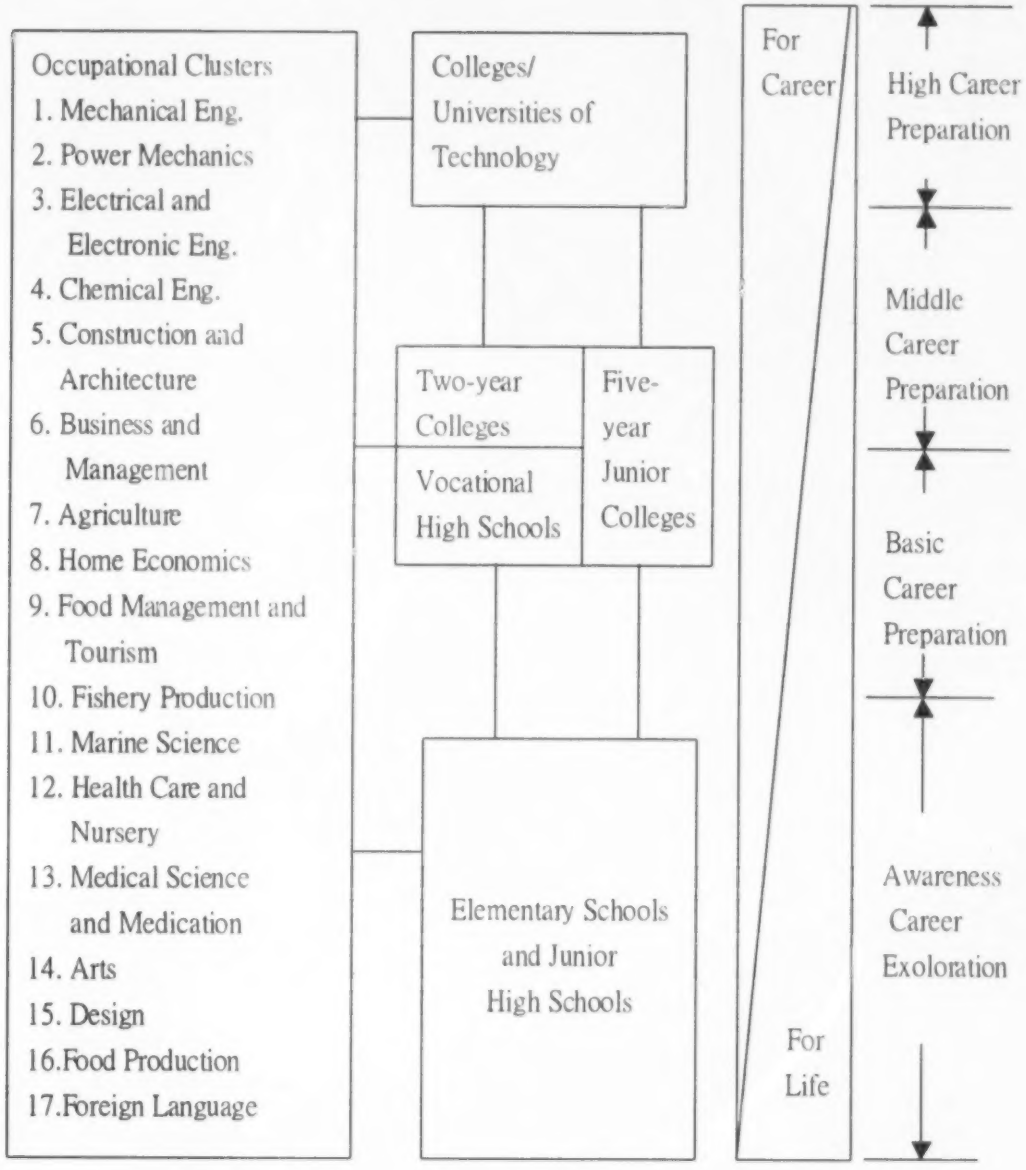


Figure 5 Occupation Clusters Penetrating Schools at All Level.

*Source* : 1. Lee (1999), p. 18.

2 . National Taiwan Normal University (2000), pp. 31-36.

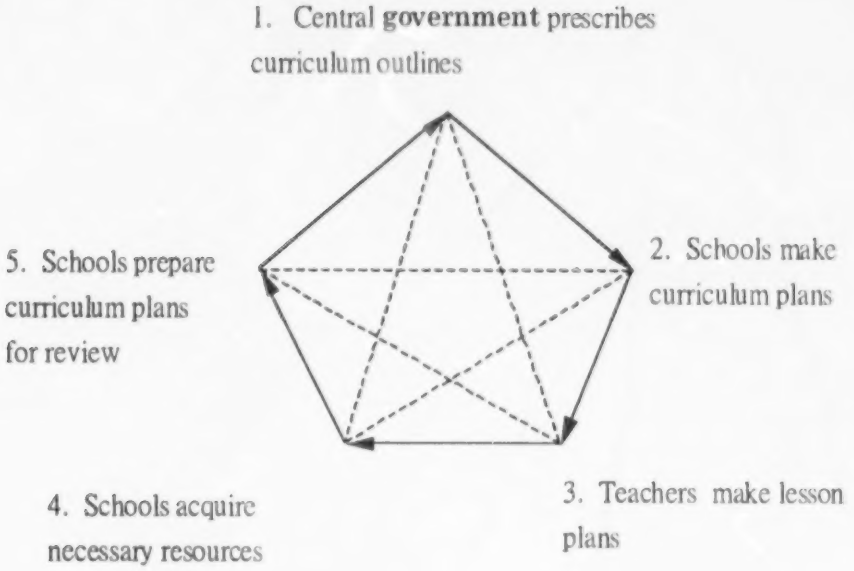
1. Central government prescribes curriculum outlines
2. Schools make curriculum plans
3. Teachers make lesson plans
4. Schools acquire necessary resources
5. Schools prepare curriculum plans for review

Figure 6 Responsibility Areas of schools versus Educational Administration and the Procedure

*Source*: Lee (1999), p. 18.

## Conclusion

In the book " Ohio's Future at Work: Beyond 2000" ( Ohio Department of Education, 2000 ) , the Vocational and Adult Education in Ohio is committed to provide quality programs and services to meet the lifelong career education needs of Ohio's youth and adults, as well as the ever-changing demands of the present and future workplace by setting up four priorities to meet the new expectations. Moreover, the effects on individuals and resulting measurements are checked to ensure that the expectations are reached. This is a typical plan for upgrading the workforce from theory base to practice. The integrative curriculum planning in TVE in Taiwan is similarly designed with the aim of providing a world-class workforce in order to compete in the global economy. The three dimensions of focus, field, and project in Figure 3 are utilized as a strategic plan to explore the curricula problems

due to inconsistency and overlapping among curriculum at different levels. The strategy can result in very constructive policies for resolving the curriculum problems existing in the current curricula.

Constant improvement in building up school-based curriculum and management can also lead to effective learning and administration in TVE schools. In addition, if curriculum articulation and integration are underway, the accountability of TVE is undoubtedly assured and such accountability has a direct positive impact on the quality of TVE.

Today's TVE schools need to meet the challenges of developing unique curricula for students at different levels and also for individual students to fully develop their potentials in education. The central focuses of the curriculum are the individual student and the learning experiences and activities associated with a curriculum (Finch & Crunkilton, 1993). Therefore, one of the school's most important responsibilities is to organize a coherent and fully articulated curriculum in order to prepare students for life and work.

While the Ministry of Education has set aside a major portion of educational resources for the integrative curriculum planning, the research results from the thirty-four projects are still accumulating. The consensus from the research results should be carried out immediately through related policies. Vocational curriculum developers need to design appropriate measures to comply with those policies in order to meet the goal of creating integrative career and technical curricula.

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